

## PERSONAL VIDEO RECORDER USER INTERFACE

### BACKGROUND OF THE INVENTION

This applications claims the benefits of U.S. Patent Application Serial  
5 Number 60/491,462 filed July 30, 2003 and U. S. Patent Application Serial Number  
60/535,120 filed January 6, 2004.

The present invention generally relates to user interface for recording and  
a user interface for browsing video content on a personal video recorder.

As the number of television stations in a metropolitan area or on a cable  
10 network has increased, the number of programs of potential interest that are presented to  
a viewer has risen dramatically. With the use of dish antennas capable of receiving direct  
satellite signals, the multitude of programs available to the viewer has further increased.

A common type of personal video recording device uses a digital  
recording medium, such as a recordable digital video disc or hard drive, to record video  
15 content. The personal video recorder is primarily used to record video broadcast or other  
available video content for viewing at a different time. Typical personal video recorders  
include an electronic programming guide to assist the user in selecting programs for  
recording. Additionally, the electronic program guide normally includes title, channel,  
and actor information to allow the user to select from a list of existing programs.

20 The user will have a tendency to record numerous programs on the  
personal video recording device, typically to the limit of the storage capacity of the  
personal video recording device. With a large amount of video recorded on the personal  
video recorder it has become increasingly evident that it has become problematic for the

user to effectively select the desirable content for viewing at any particular time.

Accordingly, a need exists for providing an interface that permits effective recording and selection of the potential video content available. However, without such electronic program guide information associated with the video content it becomes more  
5 problematic to select programs for recording or otherwise selecting among the programs recorded by the personal video recorder for subsequent viewing.

#### BRIEF DESCRIPTION OF THE DRAWINGS

10 FIG. 1 illustrates a user interface for a personal video recorder.

FIG. 2 illustrates standard playback mode.

FIG. 3 illustrates a video recorder for adding a recording.

FIG. 4 illustrates a message for adding a recording.

FIG. 5 illustrates a list for a set of recordings.

15 FIG. 6 illustrates editing the set of recordings.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A personal video recorder may record video content onto a recordable  
20 medium, such as a hard drive. A large selection of different potential video content may be recorded by the system onto the recordable medium based upon some criteria. Each of the available recorded programs on the personal video recorder may be presented to the user in the form of plurality of different video clips, with each video clip associated with

a different recorded program. In many cases, a personal video recorder may be a stand alone box, a computer system, or a television with an integrated recording technique.

Referring to FIG. 1, the video clips are preferably presented to the user in the form of an x-y grid with a key frame being illustrated. In order to obtain more information regarding the recorded program associated with the key frame, so that the user may select the most appropriate content, a video clip of the video may be presented by selecting one of the key frames. In this manner the user may visually observe key frames associated with a video and thereafter select a key frame to observe a video clip associated with the video.

The length of the selected video clip or video, the quality of the selected video clip or video, and the source location of the selected video clip or video, may also be presented to the user. A video clip preview mode may be entered automatically by inactivity of the user or otherwise by the user electing a preview mode. The preview mode presents a portion of the selected video clip, such as 15 seconds, then the preview mode presents subsequent video clips. In this manner, a sequence of video clips may be presented to the user without user intervention. The preview mode may present the video in full screen mode or otherwise in a larger window than the size provided for the key frame. If desired, the preview mode may automatically be entered by a sufficient duration of inactivity, such as 1 minute. Pressing any button on the remote control, or otherwise, may be used to exit the preview mode.

Since the system may automatically record different videos and thereafter automatically create a respective video clip associated with the different videos, the user may determine after viewing the key frame or video clip whether the associated video is desirable. In this case, the user may delete or keep the video, associated video clip, and

key frame by pressing the delete or keep button, respectively. In addition, because the personal video recorder tends to have limited storage capability the older video clips may be automatically deleted to provide storage space for new video clips. The auto-delete function may be selectively turned on and off by the user.

5                   Referring to FIG. 2, the standard video playback mode permits typical video features such as rewind, pause, stop, fast forward, fast rewind, which may be controlled by the remote control and/or icons presented on the display. After a sufficient duration, the controls may be removed from the screen so that the user may view the video clip without any overlays. This mode is useful for full-screen playback where the  
10 controls would otherwise overlay the video.

                  Referring to FIG. 3 the system may include a set of recording functions, such as where to record to, channel to record, month to record, day to record, time to start recording, time to stop recording, whether to repeat the recording, the quality to record, and whether to save these settings. Also, a list of these settings maybe crated by selecting  
15 “add to list” and the resulting list may be viewed by selecting “view list”.

                  Referring to FIG. 4, when the user presses “add to list” a message may be temporarily displayed to provide feedback and notices to the user. For example, the feedback may include a warning that there is already a recording for the selected time and channel. Also, a warning may be provided that there is insufficient storage capability to  
20 record the selected content.

                  Referring to FIG. 5, the user may edit the list of saved preferences resulting from the “add to list” feature. The user may edit or delete the settings. The “REP” entry indicates whether the recording should be periodically repeated or whether it

is a “one time” recording. Also, the frequency of the recording may likewise be displayed, such as hourly, daily, weekly, and monthly. In addition, after recording the desired content the “KEEP” entry indicates whether the preference should be automatically removed from the list or not. Other information is likewise presented.

5 Referring to FIG. 6, the user may edit the recording entry if desired.

While any technique may be used to create the video clips of portions of the videos, it has been determined that many broadcast type programs tend to have similar characteristics during similar portions of the video. For example, if a particular program is recorded every Thursday night at 8:00pm and that program has the same  
10 introduction each night, showing the same introduction portion for each video clip will not help the user to distinguish between any of the episodes that are recorded. The portion of the video to use as a video clip is preferably selected by a algorithm that attempts to find portions of the video that will make it easily distinguishable from the other video clips. In this manner, the system preferably compares all or a portion of the  
15 other video clips to determine whether a modified technique should be used to create a video clip or otherwise which portion of the video to use for the video clip. Accordingly, the technique creates video clips that are sufficiently different from one another so that the user is able to distinguish similar videos from one another.

This modification of the summarization technique being applied to the  
20 video clips is especially useful, , especially in the case of a personal video recorder. For example, in the broad sense the video summarization technique is suitable to summarize the same video clip using the “same” technique resulting in a different summarization because of the other summarization(s).

The technique may be implemented in a number of ways:

First, since it is likely that the first part of the recorded video may contain titles or commercials the technique may skip the first section (e.g., 10%) of the video and begin processing there.

5                      Second, recording rules can be set up to record weekly or daily at a specific time, so the technique can then compare video among different video clips recorded by the same recording rule. If the video clips are determined to be sufficiently similar then that part of the video may be intro-video and will be skipped until the video is no longer the same.

10                     Third, video clips made by the same recording rules can vary the place where they select the clip from based on time alone. Video1's video clip would come from 12% into the video, while video 2's would come from 10% into the video.

                        Fourth, commercial detection may be done to avoid selecting those portions of the video. .